IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: BAHA T. TANJU		§	ART UNIT: 2477
		§	
SERIAL NO.: 10/825,337		§	
		§	EXAMINER:
FILED:	April 15, 2004	§	Nima Mahmoudzadeh
		§	
FOR:	Systems and Methods of Providing	§	
	Redundant Communication to an	§	CONFIRMATION NO.: 8644
	Electronic Device	§	

APPEAL BRIEF

Atty. Dkt. No.: 1600-09700
Clt. Ref. No.: OTE-030608 US
Customer No. 45933
Date: January 11, 2010

Mail Stop Appeal Brief – Patents
Commissioner for Patents
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Alexandria, VA 22313-1450

Sir:

Appellants hereby submit this Appeal Brief in connection with the above-identified application. A Notice of Appeal was filed on November 11, 2009.

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I. REAL PARTY IN INTEREST

The real party in interest is Cameron International Corporation, a corporation having its principal place of business in Houston, Texas. The Assignment from the inventors to Cooper Cameron Corporation was recorded on April 30, 2004 at Reel/Frame 015275/0303. The Cooper Cameron Corporation is now known as Cameron International Corporation.

II. RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any related appeals or interferences.

III. STATUS OF THE CLAIMS

Originally filed claims: 1-27

Added claim 28

Claim cancellations: 22-23

Withdrawn claims: None

Presently pending claims: 1-21 and 24-28

Presently allowed claims: 5-9, 15-17 and 27

Presently appealed claims: 1-4, 10-14, 18-21, 24-26 and 28.

IV. STATUS OF THE AMENDMENTS

Appellants submitted amendments to claims 5, 8 and 28 on October 13, 2009 in response to the Final Office Action dated August 11, 2009. In an Advisory Action dated November 17, 2009, the Examiner indicated the amendments had been entered.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The following provides a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number and to the drawings by reference characters as examples of support for claim elements, as required by 37 C.F.R. § 41.37(c)(1)(v). Each element of the claims is identified by a corresponding reference to the specification and drawings where applicable. Note that the citation to passages in the specification and drawings for each claim element does not imply that the limitations from the specification and drawings should be read into the corresponding claims.

As described in Appellants' specification, a technique for providing redundant data communication to an electronic slave device is provided. See at least Fig. 1 and paragraph [0012]. At least some illustrative embodiments are systems as in claim 1:

1. A system, comprising:
a first master device **{102, Fig. 1}** generating a first data stream;[1]
a second master device **{104, Fig. 1}** generating a second data stream, the first and second master devices **{102, 104}** being independent;[2]
a redundancy manager **{106, Fig. 1}** coupled to the first and second master devices **{102, 104}**;[3] and
a slave device **{110, Fig. 1}** coupled to the redundancy manager **{106}**,[4]
wherein the redundancy manager **{106}** is operable to receive the first data stream from the first master device **{102}** and the second data stream from the second master device**{104}**,[5] and
wherein the redundancy manager **{106}** is operable to selectively forward one of the first and second data streams to the slave device **{110}**.[6]

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[1] See at least Fig. 1 and lines 1-7 of paragraph [0015], page 3.

[2] See at least Fig. 1; lines 1-5 of paragraph [0012], page 2; and lines 1-7 of paragraph [0015], page 3.

[3] See at least Fig. 1 and lines 1-6 of paragraph [0014], page 3.

[4] See at least Fig. 1; lines 1-5 of paragraph [0012], page 2; and lines 5-6 of paragraph [0014], page 3.

[5] See at least Fig. 1 and lines 1-8 of paragraph [0015], page 3.

Other illustrative embodiments are redundancy manager devices as is claim 10:

10. A redundancy manager device **{106, Fig. 1}** for providing redundant data communication to a slave device **{110, Fig. 1}**,[7] the redundancy manager device **{106}** comprising:

a first processor **{120, Fig. 2}**;[8] and

a switching mechanism **{124, Fig. 2}** coupled to the first processor **{120}**,[9]

wherein the switching mechanism **{124}** is configured to receive a first data stream associated with a first master device **{102, Fig. 1}** and a second data stream associated with a second master device **{104, Fig. 1}**,[10]

wherein the switching mechanism **{124}** is configured to implement a default configuration that forwards one of the first and second data streams to the slave device **{110}**,[11]

wherein the first processor **{120}** is configured to provide a switch control signal **{135, Fig. 2}** that causes the switching mechanism **{124}** to switch between forwarding the first data stream and forwarding the second data stream,[12]

wherein the first processor **{120}** asserts and de-asserts the switch control signal **{135}** in response to a determination of first and second data stream integrity and mastership transfer commands associated with the first and second master devices **{102, 104}**.[13]

Other illustrative embodiments are methods as is claim 18:

18. A method performed by a redundancy manager device **{106, Fig. 1}**, comprising:

receiving a plurality of data streams, each data stream being received from a different master device **{102 and 104, Fig. 1}**;[14] and

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[6] See at least Fig. 1; lines 1-5 of paragraph [0016], page 3; and lines 1-7 of paragraph [0021], page 4.

[7] See at least Figs. 1-2 and lines 1-7 of paragraph [0021], page 4.

[8] See at least Fig. 2 and lines 2-3 of paragraph [0029], page 6.

[9] See at least Fig. 2 and lines 5-7 of paragraph [0029], page 6.

[10] See at least Fig. 2 and lines 1-7 of paragraph [0030], page 6.

[11] See at least Fig. 2 and lines 1-2 of paragraph [0022], page 4.

[12] See at least Fig. 2 and line 5 of paragraph [0031] to line 7 of paragraph [0034], page 7.

[13] See at least Fig. 2 and line 1 of paragraph [0031] to line 7 of paragraph [0032], pages 6-7.

[14] See at least Figs. 1-2 and lines 1-8 of paragraph [0015], page 3.

forwarding one of the data streams to a slave device **{110, Fig. 1}** according to a prioritization of data stream validity estimates, requests to forward a particular data stream, and a switch-based timing threshold.[15]

Other illustrative embodiments are methods as is claim 24:

24. A system, comprising:

a first master device **{102, Fig. 1}**;[16]

a second master device **{104, Fig. 1}**;[17]

a subsea tool **{110, Fig. 1}** responsive to commands received from the first and second master devices **{102, 104}**;[18]

means for switching mastership **{124, Fig. 2}** of the subsea tool **{110}** between the master devices **{102, 104}**;[19] and

means for controlling **{120, Fig. 2}** coupled to the means for switching mastership **{124}**, wherein the means for controlling **{120}** asserts and de-asserts a signal **{135, Fig. 2}** to control the means for switching mastership **{124}** based on requests originating from an active master device and requests originating from an idle master device.[20]

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[15] See at least Fig. 2 and line 3 of paragraph [0044] to line 7 of paragraph [0045], pages 9-10.

[16] See at least Figs. 1-2 and lines 1-7 of paragraph [0015], page 3

[17] See at least Figs. 1-2; lines 1-5 of paragraph [0012], page 2; and lines 1-7 of paragraph [0015], page 3.

[18] See at least Figs. 1-2; lines 1-5 of paragraph [0012], page 2; and lines 1-9 of paragraph [0049], page 11.

[19] See at least Figs. 1-2 and lines 5-7 of paragraph [0029], page 6.

[20] See at least Figs. 1-2 and line 1 of paragraph [0041] to line 9 of paragraph [0042], page 9.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-3, 10-14 and 18-21 are anticipated under 35 U.S.C. § 102(e) by U.S. Pat. No. 6,910,078 ("*Raman*").

Whether claims 4 and 24-26 are obvious under 35 U.S.C. § 103(a) over *Raman* in view of U.S. Pat. No. 6,116,345 ("*Fontana*").

Whether claim 28 is obvious under 35 U.S.C. § 103(a) over *Raman* in view of U.S. Pub. No. 2002/0101888 ("*Keck*") and *Fontana*.

VII. ARGUMENT

A. Whether claims 1-3, 10-14 and 18-21 are anticipated under 35 U.S.C. § 102(e) by *Raman*

1. Claims 1-3

Claim 1, in part, requires "a first master device generating a first data stream" and "a second master device generating a second data stream, the first and second master devices being independent". Claim 1 further requires "[a] redundancy manager [that] is operable to selectively forward one of the first and second data streams to [a] slave device". The Examiner cites *Raman* as anticipating these limitations. See Office Action dated 08/11/09, page 2, item 3. At issue is whether *Raman* teaches Applicant's claimed "first and second master devices" and "redundancy manager" that is operable to selectively forward one of the first and second data streams from the master devices to a slave device. To support the anticipation rejection, the Examiner compares *Raman's* servers 120 and 122 to Applicant's claimed "first and second master devices". Further, the Examiner compares Raman's client 130 to Applicant's claimed "slave device". Applicant submits that the Examiner's reliance on *Raman* to support the anticipation rejection is improper at least because the well-known relationship of clients and servers is the opposite of the Examiner's interpretation. In other words, *Raman's* servers 120 and 122 are not comparable to Applicant's claimed "first and second master devices" as argued by the Examiner. Further, *Raman's* client 130 is not comparable to Applicant's claimed "slave device" as argued by the Examiner. In general, servers wait to receive requests from a client and then respond to such requests. Thus, servers (*e.g.,* Raman's servers 120 and 122) are akin to slave devices and clients (*e.g.,* Raman's client 130) are akin to master devices, which is the opposite of the Examiner's interpretation.

Providing the correct master/slave interpretation to *Raman's* client/server scheme results in *Raman* teaching a system that is significantly different from Applicant's claimed system. Instead of teaching "first and second master devices" and a "slave device" as in claim 1, *Raman* teaches a single master device (client 130) and multiple slave devices (servers 120 and 122). Further, instead of teaching Applicant's claimed "redundancy manager [that] is operable to

selectively forward one of the first and second data streams [generated by the first and second master devices] to the slave device" as in claim 1, *Raman* teaches a failover manager 150 that detects when a slave device (server 120) cannot respond to a request from a master device (client 130) and causes another slave device (server 122) to respond to the request. See col. 9, lines 9-29. Accordingly, *Raman* does not anticipate claim 1. Based on the foregoing, Appellant respectfully requests that the anticipation rejection of claims 1-3 in view of *Raman* be reversed.

2. Claims 10-14

Claim 10, in part, requires "a redundancy manager device" with a switching mechanism "configured to receive a first data stream associated with a first master device and a second data stream associated with a second master device" and where "the switching mechanism is configured to implement a default configuration that forwards one of the first and second data streams to the slave device". For much the same reasons as given for claim 1, *Raman* does not teach the above limitations. More specifically, because *Raman* only teaches one master device (server 130), *Raman* does not teach "a first data stream associated with a first master device" and "a second data stream associated with a second master device" as in claim 10. Further, instead of teaching the claimed "switching mechanism" that receives the first and second data streams (associated with first and second master devices) and forwards one of these streams by default, *Raman's* failover manager process 150 enables redundant slave devices (servers 120 and 122) to service requests from a single master device (client 130). Even assuming, *arguendo*, that one of *Raman's* slave devices (severs 120 and 122) were configured by default to service requests from the client 130, *Raman* still would not teach the above limitations because *Raman* only has a single master device. Accordingly, *Raman* does not anticipate claim 10. Based on the foregoing, Appellant respectfully requests that the anticipation rejection of claims 10-14 in view of *Raman* be reversed.

3. Claims 18-21

Claim 18, in part, requires "receiving a plurality of data streams, each data stream being received from a different master device" and "forwarding one of the data streams to a slave device according to a prioritization of data stream validity estimates, requests to forward a particular data stream, and a switch-based timing threshold". For much the same reasons as given

for claim 1, *Raman* does not teach the above limitations. More specifically, because *Raman* only teaches a single master device, *Raman* does not teach "receiving a plurality of data streams, each data stream being received from a different master device" as in claim 18. Further, *Raman* does not teach "forwarding one of the data streams [from different master devices] to a slave device according to a prioritization of data stream validity estimates, requests to forward a particular data stream, and a switch-based timing threshold". Instead, *Raman* teaches switching or restarting a data stream from a master device (client 130) from one slave device to another (servers 120 and 122). Accordingly, *Raman* does not anticipate claim 18. Based on the foregoing, Appellant respectfully requests that the anticipation rejection of claims 18-21 in view of *Raman* be reversed.

B. Whether claims 4 and 24-26 are obvious under 35 U.S.C. § 103(a) over *Raman* in view of *Fontana*

1. Claim 4

Claim 4 depends from claim 1 and is allowable over *Raman* for the same reasons as given for claim 1. Further, *Fontana* does not overcome the deficiencies of *Raman* with respect to claim 1. In addition, claim 4 requires "the slave device comprises a subsea tool". The Examiner concedes that *Raman* does not teach a subsea tool and relies on *Fontana* to support the obviousness rejection. See Final Office Action dated 08/11/09, page 7, item 5. Although *Fontana* teaches a subsea tool, the Examiner's suggestion to modify *Raman's* client/server system for use with a subsea tool is not an obvious modification. The Examiner has not provided any objective evidence to explain how such a modification is even possible. As previously explained, *Raman's* servers 120 and 122 are akin to slave devices. So the Examiner's proposed modification would involve replacing at least one of *Raman's* slave devices (servers 120 and 122) with a subsea tool. Even if such modification were possible, Applicant submits that the proposed modification to *Raman* improperly renders *Raman* unsatisfactory for its intended purpose to provide a client/server system with redundant servers. See MPEP § 2143.01, section V. In other words, replacing at least one of *Raman's* servers 120 and 122 with *Fontana's* subsea tool (which does not operate as a server in a client/server scheme), would disable *Raman's* redundant server scheme. Further, due to the above deficiencies in the Examiner's proposed combination of *Raman* and *Fontana*, the Examiner has failed to clearly and explicitly articulate

the reason(s) why claim 4 would have been obvious as is required. Based on the foregoing, Appellant respectfully requests that the obviousness rejection of claim 4 in view of *Raman* and *Fontana* be reversed.

2. Claim 24

Claim 24, in part, requires "a first master device" and "a second master device". Claim 24 further requires "a subsea tool responsive to commands received from the first and second master devices" and "means for switching mastership of the subsea tool between the master devices". For much the same reasons as given for claim 4, *Raman* and *Fontana*, considered individually or together, do not render obvious the limitations of claim 24. Based on the foregoing, Appellant respectfully requests that the obviousness rejection of claims 24-26 in view of *Raman* and *Fontana* be reversed.

C. Whether claim 28 is obvious under 35 U.S.C. § 103(a) over *Raman* in view of *Keck* and *Fontana*

Claim 28 depends from claims 1 and is allowable over *Raman* for the same reasons as given for claim 1. Claim 28 also depends from claim 4 and is allowable over *Raman* and *Fontana* for the same reasons as given for claim 4. *Keck* does not overcome the deficiencies of claim *Raman* and *Fontana* with respect to claims 1 and 4. Further, claim 28 requires "both of the first and second master devices are configured to simultaneously monitor a data stream from the subsea tool". The Examiner concedes that *Raman* and *Fontana* do not teach these limitations and relies on *Keck* to support the obviousness rejection. See Final Office Action dated 08/11/09, page 9, item 6. However, *Keck's* description of simultaneous communication between upstream and downstream devices is not the same as Applicant's claimed "both of the first and second master devices are configured to simultaneously monitor a data stream from the subsea tool". First, *Keck* does not teach "monitoring" of a data stream as in claim 28. Second, *Keck's* simultaneous communication technique refers to two-way communication between devices (see paragraphs [0026] and [0027]) and not simultaneous monitoring of a data stream by two different devices as in claim 28. Based on the foregoing, Appellant respectfully requests that the obviousness rejection of claim 28 in view of *Raman*, *Keck*, and *Fontana* be reversed.

D. CONCLUSIONS

For the reasons stated above, Appellants respectfully submit that the rejections should be reversed. It is believed that no extensions of time or fees are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required (including fees for net addition of claims) are hereby authorized to be charged to Deposit Account No. 03-0335 of Cameron International.

Respectfully submitted,

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VIII. CLAIMS APPENDIX

Listing of Claims

1. A system, comprising:

a first master device generating a first data stream;

a second master device generating a second data stream, the first and second master devices being independent;

a redundancy manager coupled to the first and second master devices; and

a slave device coupled to the redundancy manager,

wherein the redundancy manager is operable to receive the first data stream from the first master device and the second data stream from the second master device, and

wherein the redundancy manager is operable to selectively forward one of the first and second data streams to the slave device.

2. The system of claim 1 wherein the first and second master devices comprise computers that are not configured to share data associated with the slave device directly with each other.

3. The system of claim 1 wherein the first and second master devices are in different locations such that a user having access to the first master device is not able to simultaneously access the second master device and vice versa.

4. The system of claim 1 wherein the slave device comprises a subsea tool.

5. A system, comprising:

a first master device generating a first data stream;

a second master device generating a second data stream, the first and second master devices being independent;

a redundancy manager coupled to the first and second master devices; and

a slave device coupled to the redundancy manager,

wherein the redundancy manager is operable to receive the first data stream from the first master device and the second data stream from the second master device, and

wherein the redundancy manager is operable to selectively forward one of the first and second data streams to the slave device,

wherein the redundancy manager is configured to selectively forward one of the first and second data streams based on a validity estimation of the first data stream, a validity estimation of the second data stream, mastership transfer commands from the first and second master devices, and timing considerations.

6. The system of claim 5 wherein the first and second master devices are configured to send the mastership transfer commands to the redundancy manager in response to user intervention and at least one of data content received from the slave device and a lack of data received from the slave device.

7. A system, comprising:

a first master device;

a second master device;

a redundancy manager coupled to the first and second master devices; and

a slave device coupled to the redundancy manager,

wherein the redundancy manager is operable to receive a first data stream from the first master device and a second data stream from the second master device, and

wherein the redundancy manager is operable to selectively forward one of the first and second data streams to the slave device,

wherein the redundancy manager is configured to selectively forward one of the first and second data streams based on a validity estimation of the first data stream, a validity estimation of the second data stream, mastership transfer commands from the first and second master devices, and timing considerations,

wherein the timing considerations prevent switching back and forth between forwarding the first data stream and the second data stream if less than a threshold amount of time has passed.

8. A system, comprising:

a first master device generating a first data stream;

a second master device generating a second data stream, the first and second master devices being independent;

a redundancy manager coupled to the first and second master devices;

a slave device coupled to the redundancy manager; and

a second redundancy manager coupled to the first master device, the second master device and the slave device, wherein the second redundancy manager is operable to receive the first and second data streams and forward one of the first and second data streams to the slave device via a second communication path that is separate from a first communication path used to transmit data from the first redundancy manager to the slave device

wherein the redundancy manager is operable to receive the first data stream from the first master device and the second data stream from the second master device, and

wherein the redundancy manager is operable to selectively forward one of the first and second data streams to the slave device.

9. The system of claim 8 wherein the slave device comprises a redundant subsea tool that is configured to receive data from both the first communication path and the second communication path, wherein the redundant subsea tool comprises redundant sensors and redundant controllers and wherein each sensor and controller is operable to perform a function according to data received from at least one of the first and second communication paths.

10. A redundancy manager device for providing redundant data communication to a slave device, the redundancy manager device comprising:

a first processor; and

a switching mechanism coupled to the first processor,

wherein the switching mechanism is configured to receive a first data stream associated with a first master device and a second data stream associated with a second master device,

wherein the switching mechanism is configured to implement a default configuration that forwards one of the first and second data streams to the slave device,

wherein the first processor is configured to provide a switch control signal that causes the switching mechanism to switch between forwarding the first data stream and forwarding the second data stream,

wherein the first processor asserts and de-asserts the switch control signal in response to a determination of first and second data stream integrity and mastership transfer commands associated with the first and second master devices.

11. The redundancy manager device of claim 10 further comprising a second processor, wherein the second processor is configured to determine the second data stream and assert a health signal to the first processor when the second data stream is invalid.

12. The redundancy manager device of claim 11 wherein the second processor is further configured to assert a first mastership transfer signal to the first processor in response to a mastership transfer command associated with transferring mastership from the first master device to the second master device.

13. The redundancy manager device of claim 12 wherein the second processor is further configured to assert a second mastership transfer signal to the first processor in response to a

mastership transfer command associated with transferring mastership from the second master device to the first master device.

14. The redundancy manager device of claim 13 wherein the first processor is configured to determine if the first data stream is invalid and to periodically determine an assertion state of the health signal, first mastership transfer signal, and the second mastership transfer signal.

15. A redundancy manager device for providing redundant data communication to a slave device, the redundancy manager device comprising:

a first processor; and

a switching mechanism coupled to the first processor,

wherein the switching mechanism is configured to receive a first data stream associated with a first master device and a second data stream associated with a second master device,

wherein the switching mechanism is configured to implement a default configuration that forwards one of the first and second data streams to the slave device,

wherein the first processor is configured to provide a switch control signal that causes the switching mechanism to switch between forwarding the first data stream and forwarding the second data stream,

wherein the first processor asserts and de-asserts the switch control signal in response to a determination of first and second data stream validity and mastership transfer commands associated with the first and second master devices,

the redundancy manager further comprising a second processor, wherein the second processor is configured to determine the second data stream validity and assert a health signal to the first processor when the second data stream is invalid,

wherein the second processor is further configured to assert a first mastership transfer signal to the first processor in response to a mastership transfer command associated with transferring mastership from the first master device to the second master device,

wherein the second processor is further configured to assert a second mastership transfer signal to the first processor in response to a mastership transfer command associated with transferring mastership from the second master device to the first master device,

wherein the first processor is configured to determine if the first data stream is invalid and to periodically determine an assertion state of the health signal, first mastership transfer signal, and the second mastership transfer signal,

wherein the first processor is configured to periodically assert a reset signal to the second processor whereby the second processor resets the health signal, the first mastership transfer signal, and the second mastership transfer signal.

16. The redundancy manager device of claim 15 wherein the first processor controls the switch control signal according to a prioritization of the first data stream validity, the health signal, the first mastership transfer signal, the second mastership transfer signal, and an amount of time since the switching mechanism last switched.

17. The redundancy manager device of claim 16 further comprising monitoring units having indicators associated with a health determination of the first master device, a health determination of the second master device, a health determination of the first processor, a health determination of the second processor, a forwarding of the first data stream, a forwarding of the second data stream, and the switch control signal.

18. A method performed by a redundancy manager device, comprising:

receiving a plurality of data streams, each data stream being received from a different master device; and

forwarding one of the data streams to a slave device according to a prioritization of data stream validity estimates, requests to forward a particular data stream, and a switch-based timing threshold.

19. The method of claim 18 further comprising cycling between forwarding the data streams if a determination is made that none of the data streams are valid.

20. The method of claim 19 further comprising detecting when a data stream becomes valid and setting a relay to forward the valid data stream.

21. The method of claim 20 further comprising upon receiving a request to forward a particular data stream determining if the particular data stream is associated with a healthy master device.

24. A system, comprising:

a first master device;

a second master device;

a subsea tool responsive to commands received from the first and second master devices;

means for switching mastership of the subsea tool between the master devices; and

means for controlling coupled to the means for switching mastership, wherein the means for controlling asserts and de-asserts a signal to control the means for switching mastership based on requests originating from an active master device and requests originating from an idle master device.

25. The system of claim 24 wherein the means for controlling further controls the means for switching mastership based on a validity estimation of the data streams from the first and second master devices and timing considerations.

26. The system of claim 24 wherein the first and second master devices are configured to send requests to transfer mastership in response to user input and at least one of data content received from the subsea tool and a lack of data received from the subsea tool.

27. A system, comprising:

a first master device;

a second master device;

a slave device responsive to commands received from the first and second master devices;

means for switching mastership of the slave device coupled between the master devices and the slave device; and

means for controlling coupled to the means for switching mastership, wherein the means for controlling asserts and de-asserts a signal to control the means for switching mastership based on requests originating from an active master device and requests originating from an idle master device,

wherein the means for controlling further controls the means for switching mastership based on a validity estimation of the data streams from the first and second master devices and timing considerations,

wherein the timing considerations prevent the means for switching mastership from switching back and forth if less than a threshold amount of time has passed.

28. The system of claim 4 wherein both of the first and second master devices are configured to simultaneously monitor a data stream from the subsea tool.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.